Abstract of the Disclosure

High-bit rate communication system for networking computing systems are described. The system uses a hybrid ultra-wideband orthogonal frequency division-multiplexing scheme. The transmitted signals are sparse pulse trains modulated by a frequency selected from a properly designed set of frequencies. The train itself consists of frequency modulated ultra-wide pulses. Sigma-Delta modulation is used in some implementations. Additionally, pilots can be transmitted over some subcarriers to demodulate an information bearing subcarrier. The system achieves good detection by integrating several pulses, and high throughput by transmitting frequencies in parallel. Unlike traditional orthogonal frequency division-multiplexing systems, a given tone is transmitted only during parts of the transmission interval.